**Spring 2014: EEP/IAS 118 Midterm Study Guide**

**Materials**

-Wooldridge Readings

-Daily Assignments

-Problem Sets

-Lecture Slides

-Class handouts

-Section Notes

-Quiz #1

-Practice Midterms:

-2011 (1, 2, 3, 4a, 4b)

-2012 (1, 2, 3, 4d, 5a)

From the practice midterms there is a clear emphasis on **interpreting regression coefficients**, **omitted variable bias**, **confidence intervals** and **hypothesis testing**. Expect these topics to appear on the exam. We will limit the calculation of CIs and hypothesis testing to examples related to our estimator for the sample mean (y\_bar). Although they are very similar, we won’t ask you to compute confidence intervals or hypothesis testing for regression coefficients as we just introduced the topic.

In addition to the practice midterms below is list of concepts you should definitely know/understand. We aren’t looking for rocket science, but you need to be conversational about these topics.

**Purpose of econometrics:**

-Description, Prediction, Causal Inference, Test Economic Theories:  Name these.  Which is the focus of this course?

**The fundamental problem of causal inference.**What is it?  Provide an example.

**The conditional expectation function and linear regression.**

-At a minimum we can use regression for a linear approximation of the CEF. That is, we can use regression results to calculate an estimated conditional mean even if we have biased regression coefficients.

**Functional form:**

**-**Interpretation of the Beta coefficient for each functional form.

**MLR1-4:**

-Understand these basic assumptions. You need not memorize the exact assumptions and notation reported in lecture or Wooldridge; however, you should know them by name (Linearity, Random Sampling, No Perfect Collinearity and Zero Conditional Mean). Be able to provide examples of when they are not satisfied.

-What property of the OLS estimator can we demonstrate assuming MLR1-4?

Re: Discuss unbiasedness of beta.

-From an applied perspective, which of the MLR1-4 is mostly likely not to be satisfied?

Re: Zero Conditional Mean. Why?

**MLR 5:**

-What is MLR 5?

-What property of the OLS estimator can be analytically calculated with the addition of MLR 5?

-From an applied perspective, we get the variance (beta) wrong, what does that mean for statistical inference?

-From the research design perspective how can we reduce the variance of Beta?

**R-squared:**

-Interpretation: What does it tell us? How is it calculated?

-When is it useful and when is it not?

**Multicollinearity:**

-Know when this happens and why it is a problem for us.

**Estimator versus an Estimate**

-Discuss the difference.

**Difference between the standard deviation of y and the standard deviation of y\_bar.**

**Normal versus Student-t distribution**

-When do we use the Student-t distribution instead of the Normal distribution?

**~~MLR 6 (very brief):~~**

~~-Why do we add MLR 6? Re: We can’t compute confidence intervals and perform hypothesis testing unless we know the full distribution of the Beta\_hats. Turns out, that assuming beta\_hat has a Normal or Student-t distribution is plausible under reasonable conditions.~~